Ultimate Solar

UHE – 165/200/250 Installation and User Manual

Warning: Please read and understand the information in this manual before installing or operating the UHE-165/200/250 solar hot water unit.

Max Energy Output 2.4 kW
Max Working Pressure 600 kPa
Watermark - AS74500

Caution: **DO NOT OBSTRUCT VENT**.
Install with 500kPa Pressure Reducing Valve on the input system
Install with 600kPa Pressure Relief Valve on Tank Outlet in a FROST FREE position - Drain pipe facing continuously downwards (Valve to AS1357.1)
Install water heater to requirements of AS/NZS3500.4

ABS Plastic Heater termination cover - IPX4

CAUTION
When working with this equipment:
Shut off water supply to prevent scalding and burning

The appliance is not to the used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction

Children should be supervised to ensure they do not play with the appliance

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1. Notice

1.1. The information in this manual is subject to change without notification. Additional pages may be inserted in future editions.

1.2. The series number can be found on packaging, user manual and the storage tank. If there is no series number or the series number is damaged, this product may not be genuine and will not be covered under warranty. Please contact the supplier for more details.

1.3. **Please ensure that cold water is not pumped or supplied into an empty tank when the collector has been exposed to direct sunlight for more than 15 minutes.** The collectors will become extremely hot and this may result in cracked tubes. Before filling for the first time after installation or if refilling after maintenance, ensure the collectors are covered so they don't overheat. Breakages due to incorrect installation or filling of the tank are not covered by warranty.

1.4. The evacuated glass solar collector tubes (hereinafter tube(s)) can stand temperatures as low as -30° when there is no water inside.

1.5. Installation needs to be done by a qualified plumber to ensure all local laws and standards are met. Warranty may be void if incorrectly installed.

1.6. The system should be mounted facing north or as close as practical to north. If there is no northern roof available, then the preference is west for domestic installations and east for commercial or daytime use of hot water.

1.7. All exposed piping should be insulated properly to prevent heat loss and provide freeze protection. In the areas with ambient temperature under -5° Celsius electric heating wire can be used to avoid frozen pipes.

1.8. Any modifications to the components will void the warranty.

2. Transporting The Solar Hot Water System

Please read instructions before collecting the solar hot water system from the transport depot or warehouse.

Ensure all cartons are in good order and the solar hot water system is undamaged before leaving the transport depot or warehouse.

Claims for damaged goods cannot be made after taking receipt of the solar hot water system.

Handle All Cartons With Care.

When handling the evacuated tube cartons do not stack boxes more than 3 layers high.

Ensure that all boxes are strapped down in order to prevent damage during transit.

It is advisable to place padding under the evacuated tube cartons during transit.

Keep all cartons dry.

The Ultimate Solar evacuated tubes are not covered by warranty against failure as a result of damage incurred during transport or installation.

3. General

3.1 The Ultimate Solar Hot Water System

Solar Evacuated Tube technology is the most powerful solar energy collector for hot water production available.

Evacuated Tube solar collectors capture the sun's energy to heat the water within the hot water cylinder to very high temperatures.

A copper coil within the hot water cylinder exchanges heat from the heated water in the storage cylinder to the water within the coil as the water travels through whenever a hot water tap is turned on for showers etc.

It is a similar design to the instantaneous gas hot water system where the water for your shower is heated in the coil as it passes through the flame.

This is a simple yet ingenious method of making hot water for your shower. It also means long-term reliability because it eliminates the need for complicated parts such as electric circulating pumps, pressure and temperature relief valves and other controllers

The water is heated directly by the evacuated tubes and stored without the need for a pump, making it more efficient and generally cheaper to install and operate.

3.2 Evacuated tube technology

Evacuated tubes offer the most efficient way to heat water, especially in cooler climates.

Evacuated tubes act like double glazed windows to prevent the heat escaping from the internal collector surface.

Made from two toughened glass tubes, one inside the other, air is evacuated from between the solar tubes to create a vacuum.

The vacuum inside the evacuated tubes is an insulation barrier, which allows the solar system to operate in freezing temperatures. Unlike flat plate glass solar collectors evacuated tubes do not require frost protection.

The insulation qualities of the evacuated tube greatly reduce conductive and convective heat loss form the interior of the tube. As a result, wind and cold temperatures have less effect on the performance of the evacuated tube collectors.

This increases the overall solar energy that can be collected to heat water.

The evacuated tubes are more resilient to hail and dirt. Hail tends to be deflected by the curved surface of the evacuated tubes. Likewise dirt and leaf litter does not adhere to the curved surface of the tube.

Solar Hot Water cannot totally replace the need for additional boosting at times by using either gas, electricity or connecting to the wetback of a slow combustion fire.

Although the heat output from evacuated tube solar collectors is reduced on overcast days it will still be able to heat water. On heavily overcast days or with heavy rain, boosting may be required to maintain water at the required temperature.

When averaged over a year, a correctly sized solar system will provide the majority of a household's hot water needs.

3.3 Hot Water Safety
In order to prevent scalding due to excessively hot water install a tempering valve with the solar hot water system. A tempering valve is an important safety device as it controls the temperature of the water supplied to the hot water taps.

Plumbing regulations state that a temperature of no greater than 50 degrees Celsius be supplied to the hot water tap on the bath and shower outlet.

Note: Tempering valves have a fine filter on both the hot and cold water connections to prevent sediment interfering with the operation of the tempering valve. For this reason it is recommended installing an inline filter before the tempering valve.

3.4 Gas Boosting
The Ultimate Solar - Solar Water Heater is compatible with gas boosting including, but not limited to, the following products;

- Rinnai Solar Gas Booster
- Bosch High flow Gas
- Booster Eternity Gas booster

Please note that gas-boosting products are an additional product to be used in conjunction with the Ultimate Solar HWS. Gas boosting products are not covered under the Ultimate Solar factory warranty.

3.5 Electric Boosting
If your system is electric boosted, the electric element will turn on automatically in order to boost the water temperature to ensure ample hot water.

If you do not wish for the booster element to switch on automatically speak with your electrical contractor about installing an 'On / Off' switch or a Timer so the booster element can be manually controlled.

3.6 Maintenance
Tubes: Under normal circumstances, no maintenance of the system is required. Due to the shape of the tubes regular rainfall and wind should keep the tubes clean. If the tubes are particularly dirty they may be washed.

A soft cloth and warm, soapy water can be used for cleaning the tubes.

If the tubes are not easily and safely accessible, a high-pressure spray can be effective to clean the evacuated tubes.

Leaf litter may gather beneath or between the tubes and should be removed to ensure optimal performance.

Common sense applies. Always take precautions. Do not endanger your self or others in the installation process, cleaning or maintenance of the solar hot water system. Wear safety equipment to prevent falling from height and be mindful of electrical hazards.

Solar Powered Water Saver: Occasionally the Photo Voltaic Panel of the water saver may need to be wiped over to remove dust to maintain power to the device.

3.7 Local Council Approval

You may have to check with your local council regarding building restrictions when installing your solar system. It is important to understand the guidelines of your local council before installing and apply for permission for installation if required.

4. Important

4.1 Standards

Installation must be completed in accordance with the requirements of AS/NZS 3500.4 (AS/NZS3500.4.2).

"National Plumbing and Drainage Code Hot Water Supply Systems **–** Acceptable Solutions**",** or in New Zealand, Clause G12 of the New Zealand Building Code, as well as any relevant local standards and regulations.

4.2 Authorised Person/s

Installation must be completed by a qualified tradesperson who holds all relevant industry licenses and/or certificates required for the work completed during the installation process.

4.3 Safety

At all times the qualified tradesperson installing the Ultimate Solar system must adhere to occupational health and safety guidelines as outlined by Workcare/Workcover in your state and/or country, and other relevant industry associations.

The qualified tradesperson installing the Ultimate Solar system is responsible at all times for their own safety. Under no circumstances should any person attempt to install an Ultimate Solar SHWS without reading and understanding this operation and installation manual.

4.4 Roof & Structural Integrity

High winds will cause vertical and horizontal loads on the frame. When installing in a high wind region, please ensure that the frame structure is able to withstand such forces.

In high wind areas ensure the frame is securely fastened to the roof in accordance with local council building requirements.

Before installing the Ultimate Solar Hot Water System have the qualified installer assess and confirm the building structure will support the weight of the commissioned solar hot water system.

4.5 Water Quality

The working design of the Ultimate Solar Hot Water System helps protect the inner surface of the stainless steel cylinder because there is not a continuous supply of water borne dissolved solids being brought into the cylinder every time a hot water tap is turned on.

The stainless steel tank in the Ultimate Solar system could be susceptible to damage from very poor quality water.

It is important to check the water quality in your local area. If in doubt, contact your local water authority or have a water test completed.

Where the water quality exceeds the following dissolved solids, hardness and chloride measure the Ultimate Solar SHWS should not be installed.

Failure to meet this measure may result in your warranty being void.

- Total dissolved solids: 600mg/litre or ppm
- Total hardness: 200mg/litre or ppm
- Chloride: 250mg/litre or ppm

Installation of a quality water filter that improves water quality may be appropriate. Please consult with a supplier of water filters and water treatment systems to determine the correct product. The use of a filter or water treatment system that does not improve water quality within the standards set may result in your warranty being void.

4.6 installation Preparation

Before departing for installation check to ensure there are no breakages to the evacuated tubes. All required tools, safety equipment and the installation manual should be taken to the installation site. It is recommended to take a digital camera to the installation site to take photos of the installation during and once completed.

When loading boxes please take care and do not stack boxes more than 3 layers high. Ensure that all boxes are strapped down in order to prevent movement. Ultimate Solar does not warrant the evacuated tube or heat pipes against failure as a result of damage incurred due to transport or installation.

Take time to familiarise yourself with the components supplied, the components that should be supplied for your Ultimate Solar solar water heater are listed herein. It is recommended to lay out all the components in a Dummy assembly to ensure you are familiar with how they will all fit together. If any components are missing, or you require additional components, please contact your supplier who should have spares parts in stock.

IMPORTANT SAFETY INFORMATION

ULTIMATE SOLAR
MODEL/UNIT NO. UHE 160/200/250

Heating Element - 240VAC 50HZ 10AMPS 2.4kW

The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, unless they have been given supervision or instruction

Children should be supervised to ensure they do not play with the appliance

The water mains is not to be connected by a hose-set

A means of disconnection must be incorporated in the fixed wiring in accordance with the wiring rules

A disconnection must be incorporated in the fixed wiring is to be provided and if single pole switching should be connected to the phase conductor

THERMOSIPHON SYSTEMS

All connections **must be made** with 3/4 pipes and no valves/restrictions are to be places in the thermosiphon pipe work

IMPORTANT INSTALLATION INSTRUCTIONS

Water supply **must** be fitted with a
500 kPa Pressure Control Valve

Vent Fitting must **NOT BE** blocked at any time

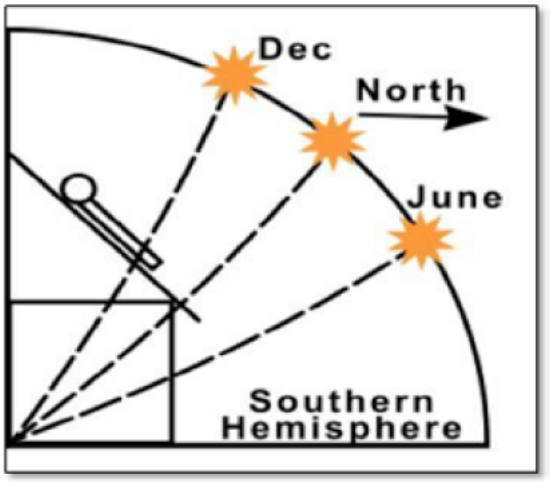
A 600 kPa Pressure Relief Valve **must** be fitted at the outlet fitting with discharge pipe directed downwards

5. Installation

5.1 Pitch Angle and Orientation of Solar Collectors

The pitch angle of the evacuated tubes in relation to latitude governs the efficiency of the solar system.

In the southern hemisphere the further south from the equator the installation is the lower the sun will be on the horizon during winter months. This can increase the need for electric, gas or slow combustion fire boosting.



However by increasing the pitch of the evacuated tubes means that more solar energy can be harnessed in winter when more hot water is needed.

The Ultimate Solar Hot Water System is supplied with a high or low-pitched frame to optimise efficiency throughout the year.

The closer to the recommended pitch the installation is the less boosting will be required.

NOTE: +/- 10 degrees variation of the pitch of the evacuated tubes does not overly effect the efficiency of the solar hot water system.

As a guide only the optimal installation angle is calculated by adding 10° to the regional latitude of the installation, for example:

Hobart's latitude: 43° + 10° = 53°
Melbourne's latitude: 38° + 10° = 48°
Sydney's latitude: 34° + 10° = 44°
Perth's latitude: 31° + 10° = 41°
Brisbane's latitude: 27° + 10° = 37°
Cairn's latitude: 16° + 10° = 26°

Note: The minimum pitch the solar hot water system can operate at is 20 degrees.

5.2 Orientation

In Australia the system should face North.

If a north orientation is not available the solar hot water system can be positioned facing east or west.

Avoid positioning the solar hot water system where the collectors will be shaded.

Consider weather patterns and shading when deciding on the position of the solar hot water system.

Some regions may have a tendency to be clear in the morning and cloud over in the afternoon therefore orientating the solar water system to face east will be the preference.

In other areas morning fog might make a west facing installation the better option.

Before installing also consider how nearby trees or buildings could shade the solar hot water system, especially in winter when longer shadows will be cast.

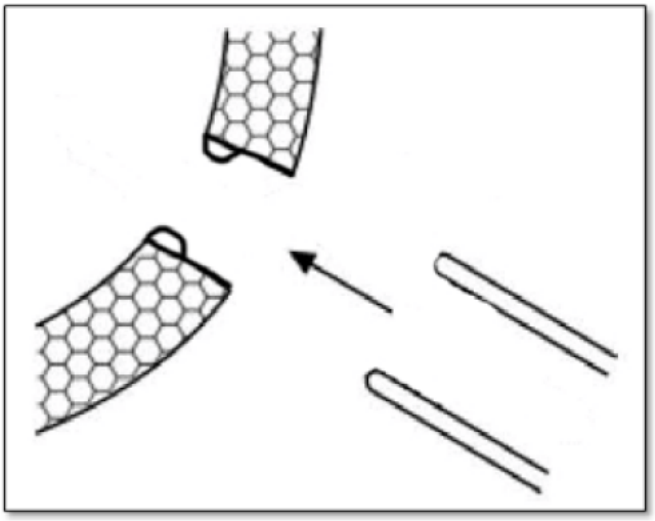
5.3 Installing the Evacuated Tubes

IMPORTANT: DO NOT INSERT EVACUATED TUBES UNTIL THE CYLINDER HAS BEEN CONNECTED TO WATER AND READY TO FILL.

KEEP EVACUATED TUBES COVERED UNTIL THE CYLINDER HAS BEEN FILLED.

Once the frame is secure to the roof the storage cylinder can be placed in position on the support cradles leaving the locking nuts loose.

Do no tighten the lock nuts that secure the storage cylinder to the cradle until after the first evacuated tube has been inserted and correctly aligned.



The insertion angle of the evacuated tube can be checked by looking from the side of the frame to make sure the evacuated tube is parallel with the 'topside' section of the frame.

The storage cylinder can be rolled a little up or down in the cradle if adjustment is required.

Once aligned the lock nuts can be tightened.

Insert remaining tubes.

FILL THE CYLINDER AT THE VENT AFTER ALL THE TUBES HAVE BEEN INSERTED. ENSURE EVACUATED TUBES ARE COVERED PRIOR TO FILLING THE TANK. OTHERWISE THERMAL SHOCK (as cold water enters hot tubes) WILL OCCUR AND TUBES WILL SHATTER.

ONLY use copper olives and matching brassware on the tank connections including the tempering valve; nylon olives WILL melt.

When handling glass it is recommended to wear protective gloves.

Take particular care to avoid damaging the glass nipple on the end of the evacuated tubes. If the glass nipple is broken the evacuated tubes will not leak however the vacuum will be lost and the tube will need to be replaced.

Inserting the evacuated tubes into the silicone seal on the storage cylinder-

- Place a black rubber weather seal over the open end of the evacuated tube and slide down the tube 150mm
- Dip the end of the evacuated tube into soapy water or smear a small amount of petroleum jelly onto the white silicon seal where the tube is to be inserted.
- Insert the open end of the evacuated tube into the storage cylinder with a twisting motion.
- Do not use excessive force to insert the tube.
- Ensure the tube is perpendicular to the storage cylinder so as to not dislodge the inner seal in the cylinder.

The evacuated tube needs only to be inserted far enough into the cylinder that the end of the evacuated tube with the glass nipple just passes the bottom tube support cradle.

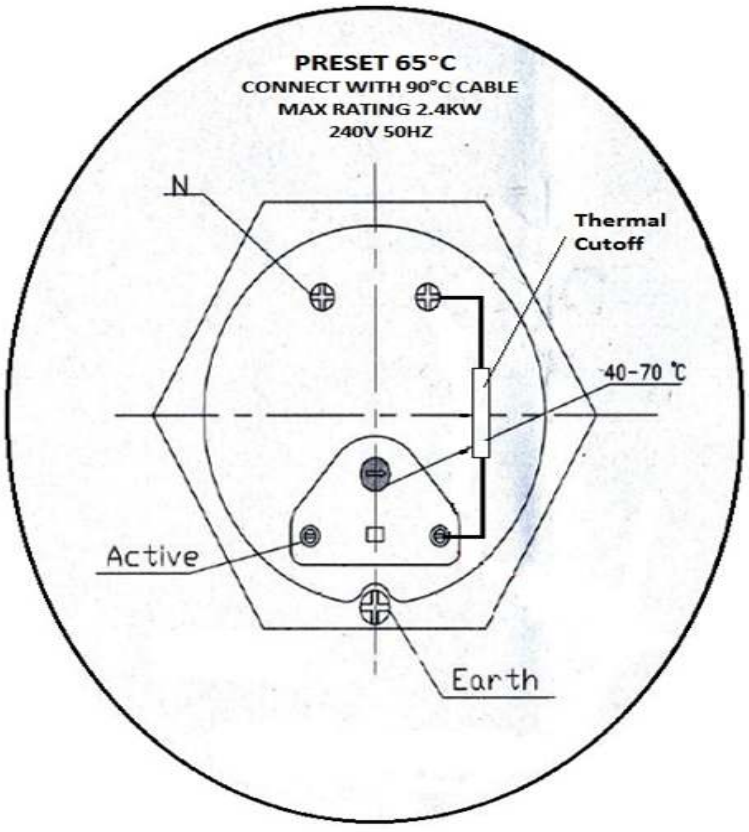
If the tube comes up against an obstacle inside the storage cylinder it will be the heat exchange coil inside. Avoid making contact with the heat exchange coil.

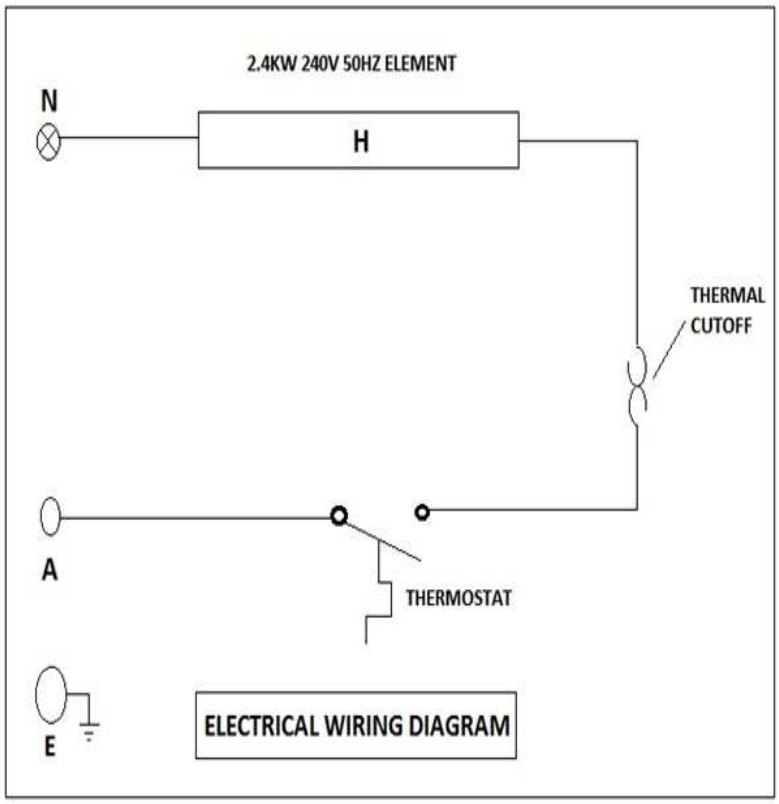
Place the white cap on the end with the glass nipple and then slide the tube back so it sits in the tube cradle.

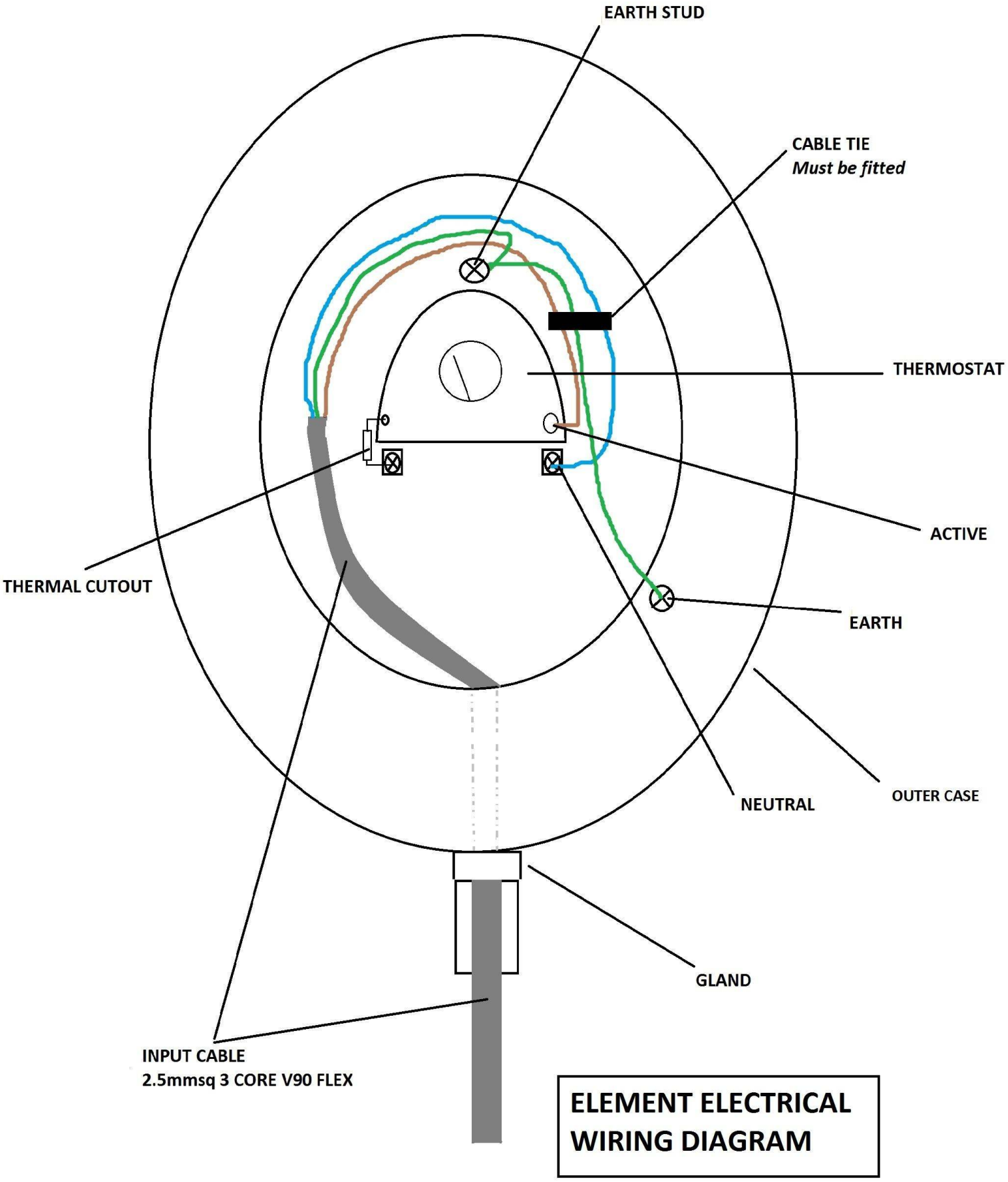
Slide black weather seal up to the face of the storage cylinder.

After all the tubes have been installed and the cylinder has been filled the evacuated tubes can be uncovered.

5.4 Electric Booster Element







ELEMENT ELECTRICAL WIRING DIAGRAM

When fitting lid, run a small bead of silicon around the edge.

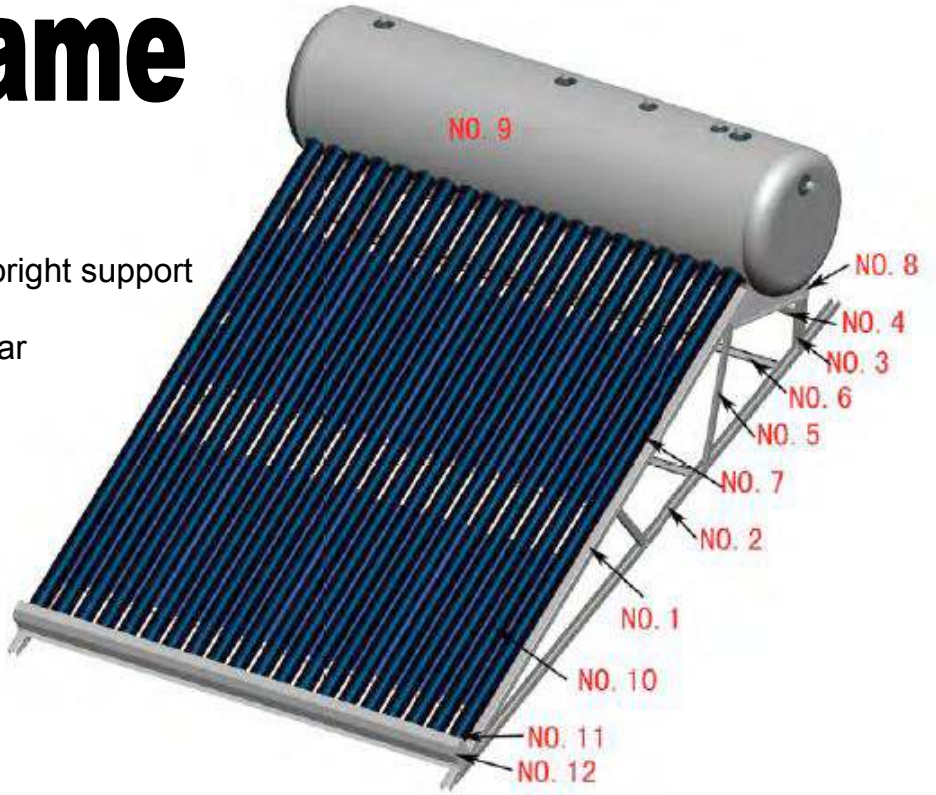
To remove cover, place tip of a flat screw driver (or similar tool) between rubber seal and plastic cover and gently pry open.

Reseal with silicon when replacing lid.

5.5 Low Frame Install

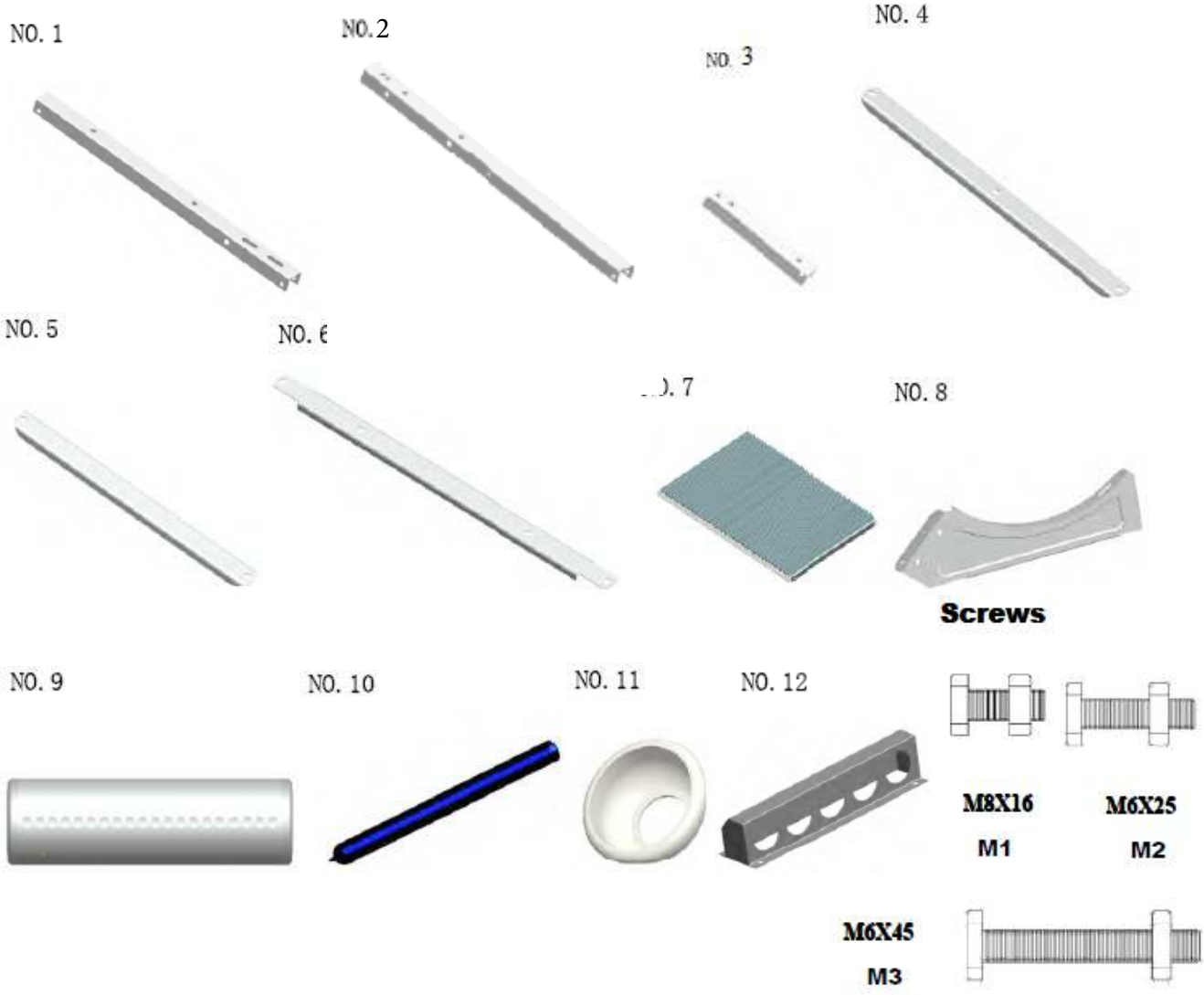
Low Frame

NO.1 Front leg
NO.2 Bottom bracket
NO.3 Back leg
NO.4 Diagonal bar of upright support
NO.5 Diagonal bar
NO.6 Bottom reflector bar
NO.7 Reflector
NO.8 Tank bracket
NO.9 Tank
NO.10 Vacuum tube
NO.11 Rubber cup
NO.12 Bottom support



Parts included

Stand pieces

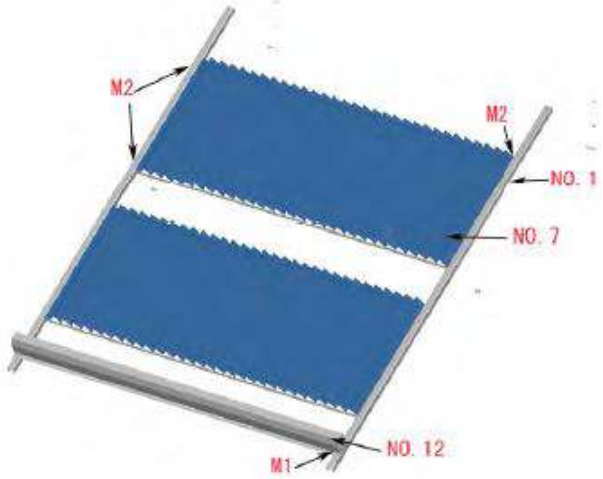


Installation procedures:

STEP A

Screws: M1 /M2 Stand pieces: NO.1/NO.7/NO.12

Instruction: Assemble stand piece NO.1 with NO.7 using M2, then assemble stand piece NO.12 with NO.1 using M1.



STEP B

Screws: M1 Stand pieces: NO.8

Instruction: Assemble stand piece NO.1 with NO.8 using M1.

STEP C

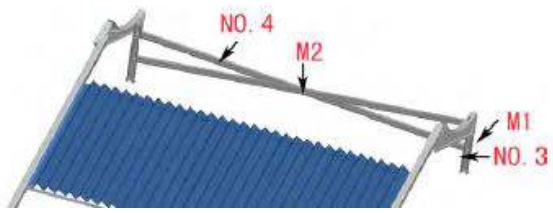
Screws: M3 Stand pieces: NO.3

Instruction: Assemble stand piece NO.3 with NO.8 using M1.

STEP D

Screws: M1/M2 Stand pieces: NO.4

Instruction: Assemble stand pieces NO.4 using M2,then assemble stand piece NO.4 with NO.3 using M1.



STEP E

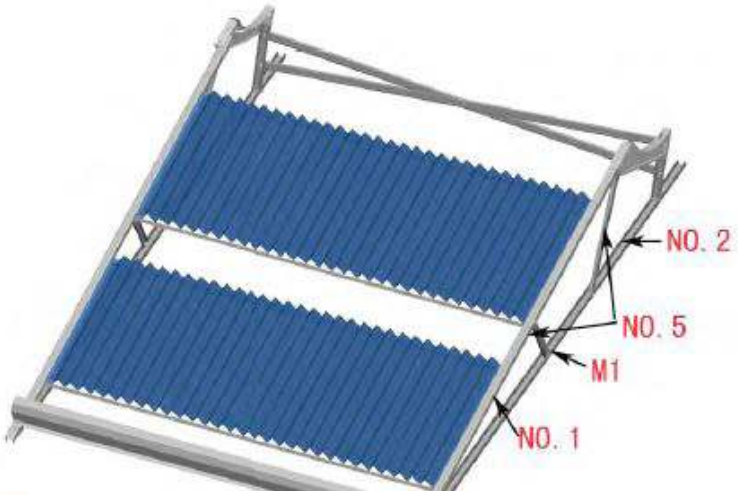
Screws: M3 Stand pieces: NO.2

Instruction: Assemble stand piece NO.2 with NO.1 and NO.3 using M3

STEP F

Screws: M1

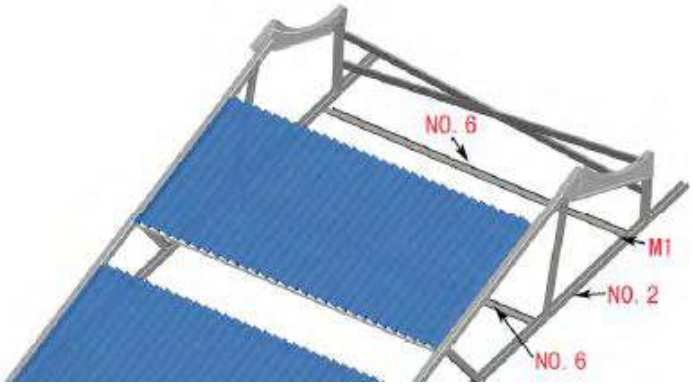
Instruction: Assemble NO.5 with NO.1 and NO.2 using M1.



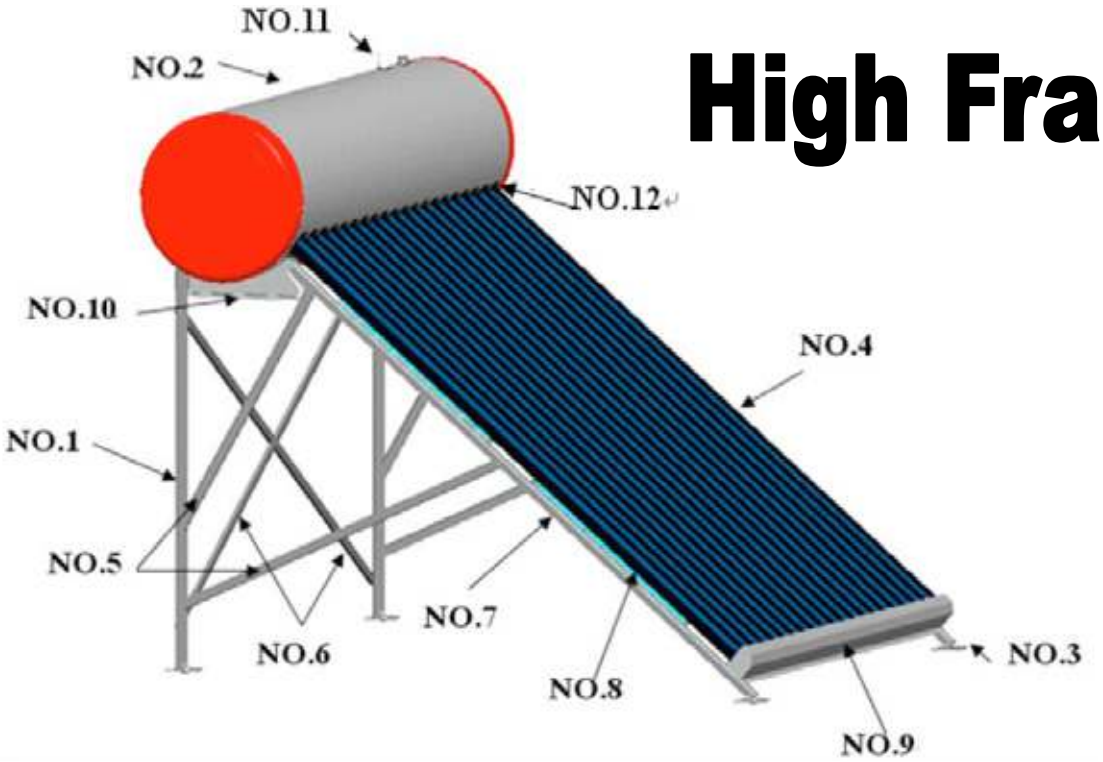
STEP G

Screws: M1

Instruction: Assemble NO.6 with NO.2 using M1.



5.6 High Frame Install

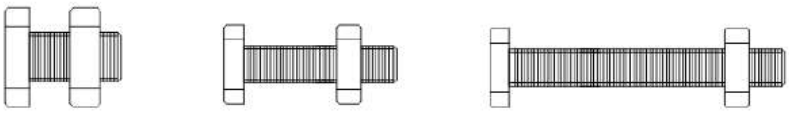


High Frame

Stand Piece

NO.1×2 NO.7×2 NO.6×2 NO.5×4

Screws



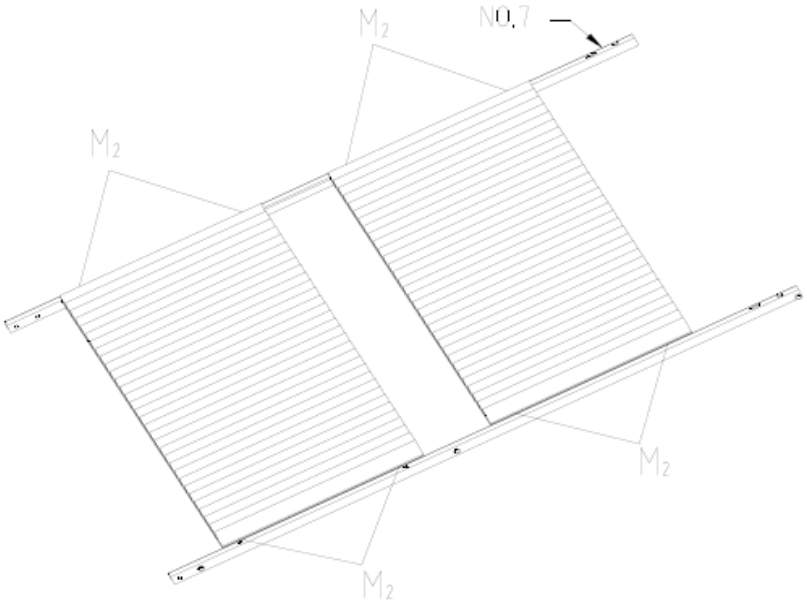
M1 **M2** **M3**

M8※12 X 20 M6※25 X 9 M6※45 X 4

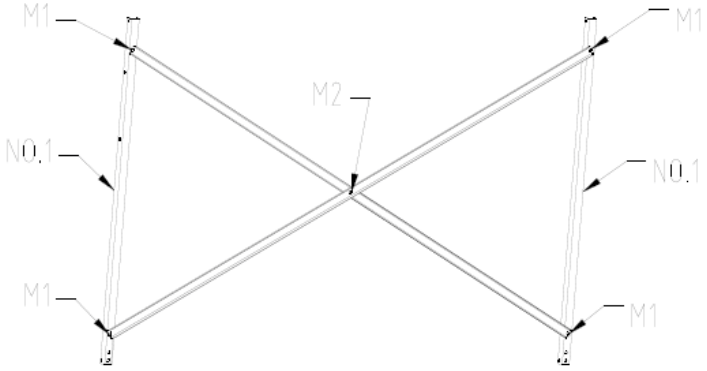
Rubber Cup NO.3×4 **Tank** NO.10×2

NO.4×20 NO.8×2 NO.9×1

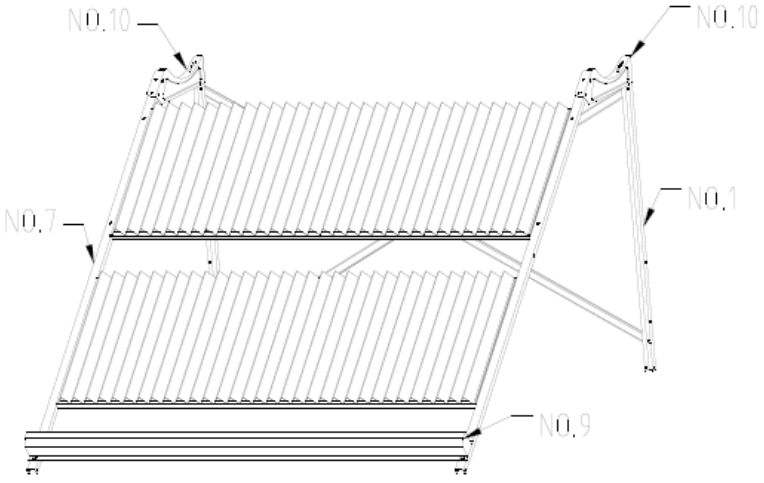
Step by step instructions:



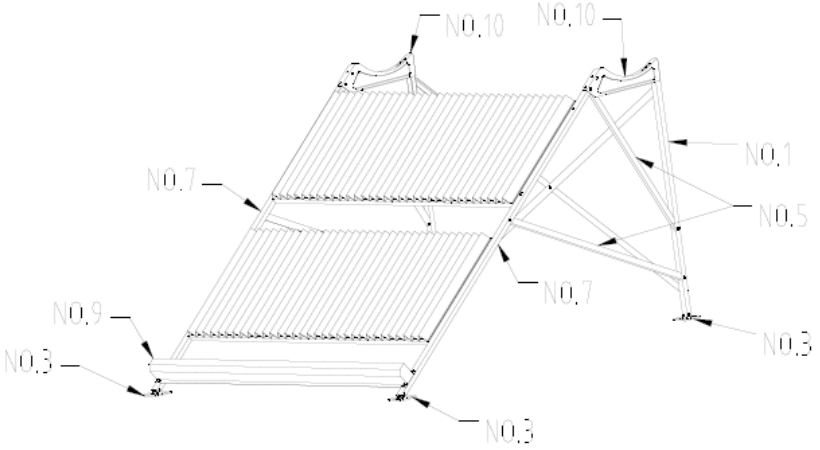
Steps	Screws	Material need	Instructions
Steps A	M2	Stand piece No.7 reflectors	Screw reflectors into stand piece No.7 using M2



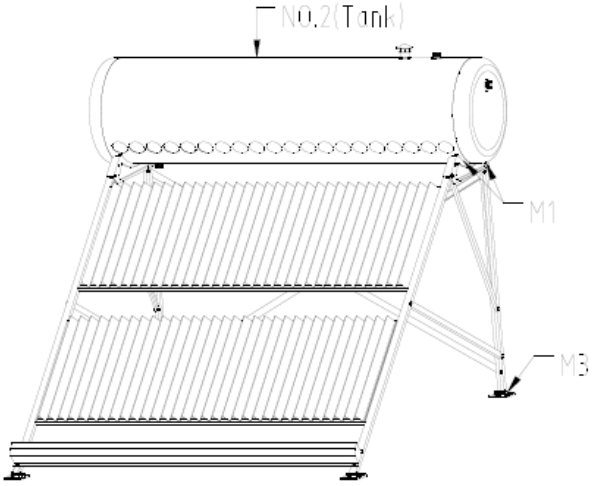
Steps	Screws	Material need	Instructions
Steps B	M1 M2	Stand piece No.1 No.6	Assemble stand pieces No.6 using M2 Then assemble X pieces with No.1 stand pieces using M1



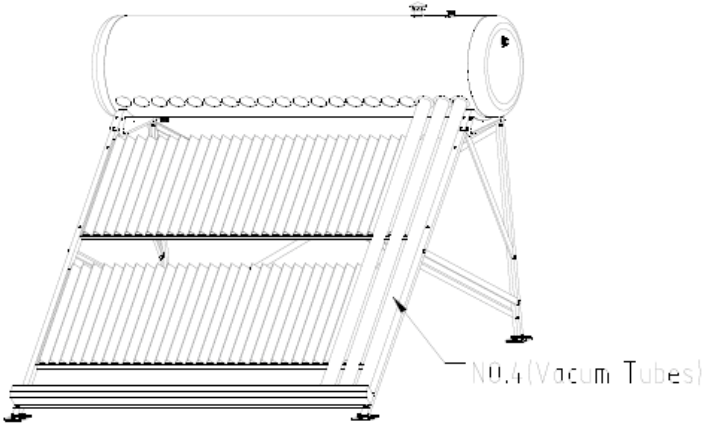
Steps	Screws	Material need	Instructions
Steps C	M1	Stand piece No.1 No.6 No.9 No.10	Assemble No.10 with No.1 and No.7 using M1 Then assemble No.9 with No.7 stand pieces using M1



Steps	Screws	Material need	Instructions
Steps D	M1 M3	Stand piece No.1 No.3 No.5 No.6 No.9 No.10	Assemble No.5 with No.1 and No.7 using M1 Then assemble No.3 with No.7 and No.1 using M3

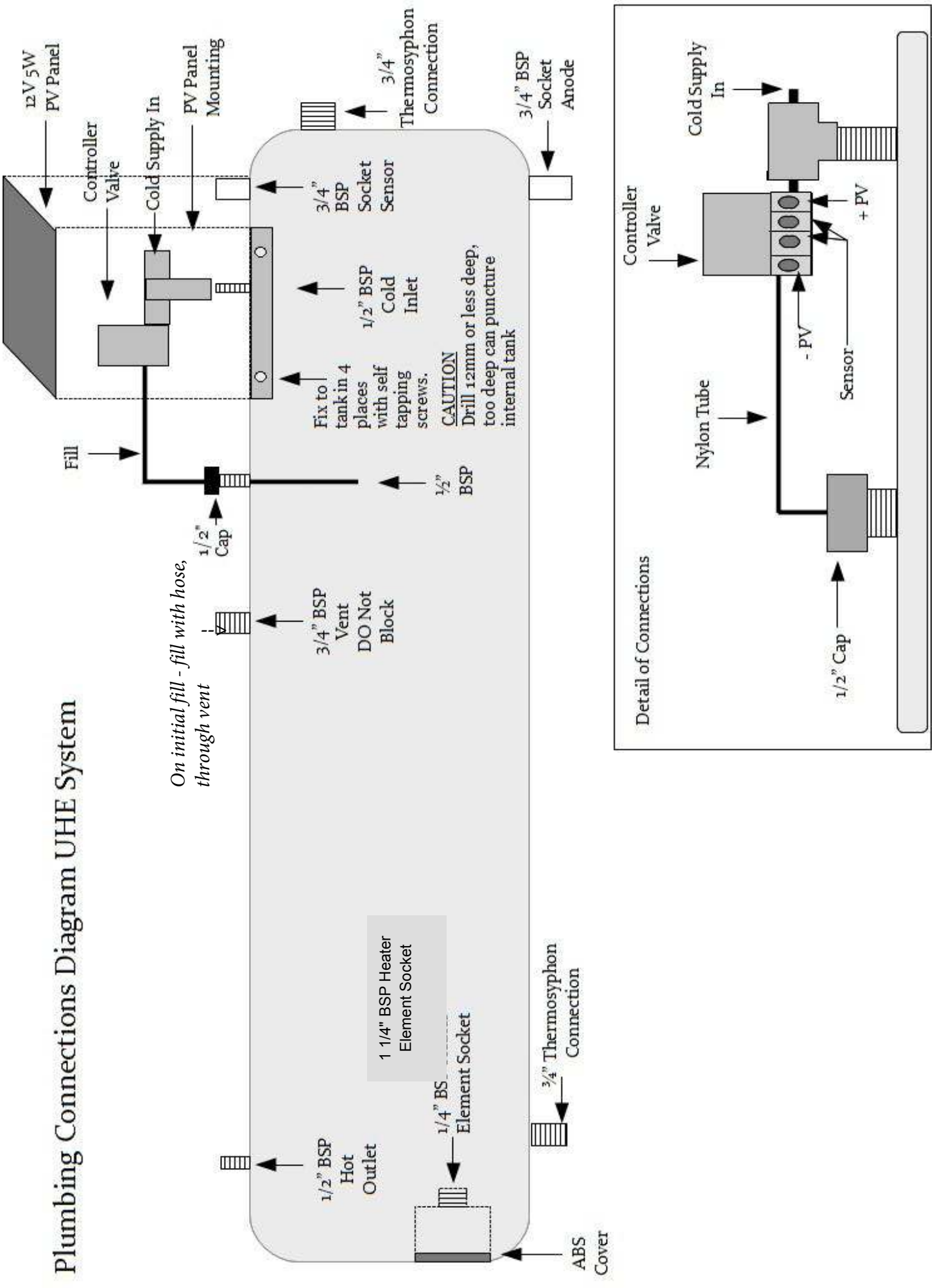


Steps	Screws	Material need	Instructions
Steps E	M1	Stand piece No.1 No.2 No.3 No.5 No.6 No.9 No.10	Assemble No.2 with No.10 using M1



Steps	Screws	Material need	Instructions
Steps G		NO.4 Rubber Cups	1.Place the rubber cups on holes on the bottom support 2.Press vacum tubes into manifold hole ★Suggestion: Spread some lubrications on the top of the vacum tube when press. Such as dishwasher

5.7 Schematic for Water Connections and Solar Powered Water Saver



6. Warranty Conditions

6.1 Warranty Inclusions

10 years warranty for the integrated water tank, based on the condition that the water quality in the tank complies with the AUS/NZS water quality standard described in section 4.5. Ultimate Solar will offer a new replacement tank if the tank leaks or fails to work during 10 years of reasonable usage valid from the date of sale.

10 years warranty on evacuated tubes.

1 year of warranty for the Ultimate Solar Workstation and Electric Element. Ultimate Solar will replace a new workstation or electric element if the workstation or element leaks or fails to work within 1 year of reasonable usage valid from the date of sale.

The Ultimate Solar water heater must be installed in accordance with the installation instructions herein, the local authorities and all relevant statutory requirements – AS 3500.4 & 5; AS5601; 00; AS2712 etc.

Installation must be done by a qualified plumber to ensure compliance with all local laws and standards.

Warranty will be void if not installed correctly.

The series number can be found on the storage tank. If there is no series number, or the series number is damaged, this product may not be genuine and will not be covered under warranty. Please contact Ultimate Solar for more details.

This warranty applies only to those components provided as part of the Ultimate Solar Water System and not any third party electrical or plumbing parts, or hot water boosting systems.

Should any part of the Ultimate Solar Water Heating System be replaced during the warranty period, the balance of the original warranty will continue to remain effective. Replacement parts will be covered by additional warranty.

Any modifications to the Ultimate Solar Water Heater or associated components will void the warranty unless permitted by Ultimate Solar.

Proof of purchase is required for any warranty claim unless otherwise permitted by Ultimate Solar.

6.2 Warranty Exclusions

1. Consequential loss resulting from fault limited to the extent allowable by law including, but not limited: to economic loss, injury to persons, pain and suffering, damage to property, or any other damages resulting from a manufacturing fault or defect.

2. Breakage or any damage to the Ultimate Solar Water Heater System due to impact from any object.

3. If the solar collector is left dry (ie. no liquid circulation) and exposed to regular daily sunlight (ie. not covered for a period exceeding 14 consecutive days).

4. The effects of sediment or sludge due to the connection to a water supply from sources such as bore water, dam water, spring water, river water, or other unfiltered hard water source.

5. Any serial tags/stickers on any of the Ultimate Solar Water Heater System components are removed or defaced.

6. Damage is incurred due to transport or installation.